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# RESEARCH MEMORANDUM

EVALUATION OF GUST AND DRAFT VELOCITIES FROM FLIGHTS OF  
P-61C AIRPLANES WITHIN THUNDERSTORMS

JULY 22, 1946 TO JULY 23, 1946  
AT ORLANDO, FLORIDA

By

H. B. Tolefson

Langley Memorial Aeronautical Laboratory  
Langley Field, Va.

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## RESEARCH MEMORANDUM

EVALUATION OF GUST AND DRAFT VELOCITIES FROM FLIGHTS OF

P-61C AIRPLANES WITHIN THUNDERSTORMS

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AT ORLANDO, FLORIDA

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The results obtained from measurements of gust and draft velocities within thunderstorms for the period July 22, 1946 to July 23, 1946 at Orlando, Florida, are presented herein. These data are summarized in tables I and II, respectively, and are of the type presented in reference 1 for previous flights.

Inspection of photo-observer records for the flights indicated that no data on ambient air temperature variations within thunderstorms were obtained.

Langley Memorial Aeronautical Laboratory  
National Advisory Committee for Aeronautics  
Langley Field, Va.

A handwritten signature in black ink, appearing to read "Harold B. Tolefson".

Harold B. Tolefson  
Aeronautical Engineer

Approved:

A handwritten signature in black ink, appearing to read "Richard V. Rhode".

Richard V. Rhode  
Chief of Aircraft Loads Division

CJB

## REFERENCE

1. Tolefson, H. B.: Evaluation of Gust and Draft Velocities from Flights of P-61C Airplanes within Thunderstorms IV - July 19, 1946 to July 20, 1946 at Orlando, Florida.  
NACA RM No. L6J16b, 1946.

TABLE I.- SUMMARY OF GUST MEASUREMENTS FROM FLIGHTS  
OF P-6LC AIRPLANES WITHIN THUNDERSTORMS

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{emax}}$ (fps)	Maximum true gust velocity $U_{t\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 347 Traverse 1					
0 - 3	26,000	5.3	-8.7	----	5
3 - 6		2.2	----	----	3
6 - 9		2.2	-3.4	5.6	3
9 - 12		2.2	-3.4	-5.7	2
12 - 15		3.4	-5.9	161	6
15 - 18		6.6	-3.4	294	5
18 - 21		6.6	-5.6	233	5
21 - 24		5.6	-5.3	175	8
24 - 27		3.4	-6.2	102	8
27 - 30		3.4	-2.8	64	5
30 - 33		5.0	-9.4	273	8
33 - 36		2.8	-8.4	65	8
36 - 39		8.4	-5.0	353	5
39 - 42		2.8	-5.0	300	5
42 - 45		5.0	-6.6	67	5
45 - 48	25,500	5.0	-9.1	169	6
48 - 51		9.4	-4.7	69	10
51 - 54		----	-2.5	----	4
					1
Airplane 347 Traverse 2					
Time (EST) 144542 - 144815 Length of traverse 155.9 sec, 52,258 ft Initial heading (deg) 340					
0 - 3	26,000	6.2	-7.2	----	3
3 - 6		9.3	-8.7	13.1	7
6 - 9		2.2	-3.4	-7.6	6
9 - 12		5.6	-5.6	33	8
12 - 15		2.2	-2.8	67	2
15 - 18		----	----	----	0
18 - 21		2.2	-2.2	----	2
21 - 24		----	----	----	0

TABLE I. - SUMMARY OF GUSTS MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{t\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 347	Traverse 3	Time (EST) 145125 - 145448			
		Length of traverse 218.1 sec, 73,551 ft			
		Initial heading (deg) 340			
0 - 3	26,000	----	-3.1	----	405
3 - 6		4.0	-3.4	----	318
6 - 9		5.3	-4.7	----	294
9 - 12		5.3	-6.2	20.1	286
12 - 15		6.8	-3.4	6.3	65
15 - 18		2.2	----	----	196
18 - 21		7.5	----	----	----
21 - 24		3.7	-6.2	----	506
24 - 27		7.1	-3.7	----	454
27 - 30		----	-5.3	----	461
30 - 33		4.0	-3.4	9.8	352
33 - 36		2.2	-3.4	5.8	33
36 - 39		7.1	-4.0	----	131
39 - 42		5.3	-11.5	----	----
42 - 45		9.3	-6.5	----	----
45 - 48		9.3	-5.6	13.7	71
48 - 51	26,500	9.0	-7.1	----	109
51 - 54		9.3	-10.6	14.9	76
54 - 57		4.4	-10.6	----	----
57 - 60	27,000	9.9	-5.0	20.3	257
60 - 63		8.4	-6.8	----	----
63 - 66	27,500	----	-7.1	----	----
66 - 69		----	-7.5	----	----
69 - 72		8.1	-5.3	----	----
72 - 75		7.8	----	----	2
Airplane 347	Traverse 4	Time (EST) - (a)			
		Length of traverse 251.9 sec, 93,018 ft			
		Initial heading (deg) - (a)			
0 - 3	26,000	4.1	-5.6	9.4	178
3 - 6		7.5	-5.0	----	----
6 - 9		13.0	-5.3	----	6
9 - 12		10.2	----	----	3

<sup>a</sup>No records obtained.

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts				
July 22, 1946 - Flight 14									
Airplane 347	Traverse 4	Time (EST) - (a) Length of traverse 251.9 sec, 93,018 ft Initial heading (deg) - (a)							
12 - 15		26,000	8.7	-5.3	9.5	-----	69	-----	4
15 - 18		26,500	12.7	-10.5	-----	-----	-----	-----	5
18 - 21			10.5	-9.9	-----	-----	-----	-----	6
21 - 24			8.3	-12.0	-----	-----	-----	-----	3
24 - 27		27,000	11.7	-7.4	-----	-----	-----	-----	9
27 - 30		27,500	6.8	-2.8	-----	-----	-----	-----	9
30 - 33		28,000	17.3	-26.3	9.6	-----	78	-----	5
33 - 36			13.3	-12.4	-----	-----	-----	-----	2
36 - 39			2.2	-5.9	6.4	-----	213	-----	3
39 - 42			9.0	-11.4	-----	-----	-----	-----	3
42 - 45			1.9	-5.6	-----	-12.1	-----	369	4
45 - 48			3.7	-----	-----	-----	-----	-----	2
48 - 51		27,500	-----	-2.5	-----	-7.4	-----	388	1
51 - 54			1.9	-3.7	4.9	-----	38	-----	4
54 - 57			7.1	-2.8	-----	-----	-----	-----	6
57 - 60			4.0	-4.3	-----	-8.9	-----	230	6
60 - 63			3.4	-2.8	4.0	-----	113	-----	2
63 - 66			1.9	-3.4	-----	-----	-----	-----	4
66 - 69		27,000	4.6	-5.6	-----	-6.5	-----	112	6
69 - 72			5.9	-4.6	-----	-----	-----	-----	2
72 - 75			-----	-3.1	-----	-----	-----	-----	2
75 - 78			3.1	-2.8	8.7	-----	38	-----	3
78 - 81		26,500	4.3	-----	8.7	-----	186	-----	4
81 - 84			5.3	-5.3	8.9	-6.9	112	188	5
84 - 87			4.0	-10.5	10.2	-----	71	-----	6
87 - 90			3.4	-----	9.3	-----	219	-----	3
90 - 93		26,000	4.9	-2.5	-----	-----	-----	-----	2
93 - 96			-----	-----	-----	-----	-----	-----	0
Airplane 347	Traverse 5	Time (EST) 151558 - 151936 Length of traverse 231.1 sec, 79,131 ft Initial heading (deg) 30				-----	-----	-----	-----
0 - 3		26,000	8.0	-5.5	-----	-----	-----	-----	7
3 - 6			4.9	-5.8	-----	-----	-----	-----	6
6 - 9			5.2	-6.4	-----	-17.1	-----	414	7

<sup>a</sup>No records obtained.NATIONAL ADVISORY  
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TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 347 Traverse 5					
9 - 12	26,000	6.7	-6.4	---	6
12 - 15		9.2	-5.5	19.2	169
15 - 18		10.1	-8.0	---	33
18 - 21		2.4	-6.4	---	4
21 - 24		4.0	-2.8	---	2
24 - 27		4.6	---	---	2
27 - 30		5.2	-11.6	---	9
30 - 33		5.2	-5.8	11.7	6
33 - 36		12.9	-5.5	---	6
36 - 39		12.9	-12.2	6.9	36
39 - 42		8.0	-5.2	---	5
42 - 45	26,500	4.0	-6.1	8.8	5
45 - 48		9.8	-10.4	---	8
48 - 51	27,000	9.5	-9.8	12.1	10
51 - 54		8.6	-5.8	---	4
54 - 57	27,500	5.2	-11.0	---	4
57 - 60		11.9	-8.6	---	6
60 - 63		9.2	-6.4	---	3
63 - 66	28,000	10.1	-15.3	13.9	5
66 - 69		4.9	-6.4	---	4
69 - 72		4.0	-6.1	---	3
72 - 75		4.9	-7.0	7.8	5
75 - 78	27,500	4.6	-6.1	---	5
78 - 81		4.6	-2.4	---	2
Airplane 333 Traverse 1					
Time (EST) 143623 - (b) Length of traverse 538.6 sec, 179,818 ft Initial heading (deg) 270					
0 - 3	21,000	---	-2.5	---	1
3 - 6		---	-3.8	---	2
6 - 9		2.2	-3.1	4.3	4
9 - 12		2.2	---	---	1
12 - 15		3.4	-3.8	---	2
15 - 18		5.0	-3.8	7.9	7
18 - 21		7.8	-3.8	14.0	8

<sup>b</sup>Records not obtained for complete traverse.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 333	Traverse 1	Time (EST) 143623 - (b) Length of traverse 538.6 sec, 179,818 ft Initial heading (deg) 270			
21 - 24		21,000	14.7	-9.4	---
24 - 27		21,500	10.3	-5.9	---
27 - 30			7.2	-4.7	14.2
30 - 33		22,000	3.8	-5.6	---
33 - 36			7.2	-8.4	---
36 - 39			6.6	-8.4	---
39 - 42			4.7	-4.4	---
42 - 45			5.9	-2.2	9.1
45 - 48		21,500	3.4	-2.2	---
48 - 51			1.9	-2.8	---
51 - 54			1.9	---	---
54 - 57			---	-1.9	---
57 - 60			---	---	---
60 - 63			2.2	-2.5	4.7
63 - 66			1.9	---	---
66 - 69			1.9	---	4.9
69 - 72			---	-1.9	---
72 - 75			1.9	-3.1	---
75 - 78			2.5	---	3.7
78 - 81			---	---	---
81 - 84			---	---	---
84 - 87			---	---	---
87 - 90			---	---	---
90 - 93			---	---	---
93 - 96			1.9	-2.2	3.6
96 - 99			---	---	---
99 - 102		21,000	2.5	-2.8	---
102 - 105			1.9	-3.1	---
105 - 108			---	---	---
108 - 111			3.1	-3.1	7.4
111 - 114			1.9	-1.9	4.7
114 - 117			---	---	---
117 - 120			2.5	---	---
120 - 123			2.5	-2.5	---

<sup>b</sup>Records not obtained for complete traverse.

TABLE I.-- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft x 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 333	Traverse 1	Time (EST) 143623 - (b) Length of traverse 538.6 sec, 179,818 ft Initial heading (deg) 270			
123 - 126		21,000	-----	-----	0
126 - 129		-----	-----	-----	0
129 - 132		-----	-----	-----	0
132 - 135		2.5	-1.9	-----	2
135 - 138		-----	-1.9	-----	1
138 - 141		-----	-----	-----	0
141 - 144		-----	-1.9	-3.6	1
144 - 147		2.5	-----	-----	2
147 - 150		3.8	-----	-----	2
150 - 153		-----	-----	-----	0
153 - 156		-----	-3.4	-----	1
156 - 159		-----	-1.6	-----	1
159 - 162		2.2	-4.1	-----	6
162 - 165		2.8	-3.8	-----	5
165 - 168		-----	-----	-----	0
168 - 171	20,500	3.8	-----	-----	1
171 - 174		-----	-----	-----	0
174 - 177		3.1	-----	-----	2
177 - 180		-----	-2.5	-----	1
Airplane 333	Traverse 2	Time (EST) 150144 - 150325 Length of traverse 177.5 sec, 58,845 ft Initial heading (deg) 360			
0 - 3		21,500	3.4	-----	3
3 - 6		4.9	-----	-----	1
6 - 9		3.7	-3.1	-----	4
9 - 12		2.5	-3.7	-----	3
12 - 15	21,000	2.5	-2.5	-----	2
15 - 18		4.3	-3.7	4.0	6
18 - 21		7.7	-3.7	-----	4
21 - 24		4.3	-9.5	-----	12
24 - 27		7.1	-3.7	-----	3
27 - 30		2.1	-3.1	-3.5	3
30 - 33		-----	-3.1	-----	2
33 - 36		8.0	-5.8	15.0	9

<sup>b</sup>Records not obtained for complete traverse.

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 333 Traverse 2	{ Time (EST) 150144 - 150325 Length of traverse 177.5 sec, 58,845 ft Initial heading (deg) 360				
36 - 39	21,000	7.7	-7.4	----	7
39 - 42	21,500	8.9	-8.0	----	7
42 - 45		7.1	-8.0	----	9
45 - 48		9.3	-5.2	----	6
48 - 51	22,000	4.6	-4.3	----	8
51 - 54		4.6	-4.0	5.2	5
54 - 57		2.8	-6.4	----	8
57 - 60		----	-1.8	68	1
Airplane 333 Traverse 3	{ Time (EST) 150616 - (b) Length of traverse 566.9 sec, 192,518 ft Initial heading (deg) 360				
0 - 3	21,500	2.4	-1.8	4.9	2
3 - 6		1.8	-1.8	----	4
6 - 9		7.0	-13.8	16.8	9
9 - 12		3.7	-3.1	7.5	9
12 - 15		4.9	-3.1	----	6
15 - 18		3.7	-3.7	7.8	3
18 - 21		----	-2.1	----	3
21 - 24		3.7	-3.7	7.2	4
24 - 27		7.3	-3.7	----	5
27 - 30		8.3	-2.4	----	5
30 - 33	22,000	10.4	-13.8	----	9
33 - 36		6.7	-10.1	19.9	5
36 - 39	22,500	4.9	-6.7	----	7
39 - 42		8.3	-11.0	----	8
42 - 45		7.6	-5.8	----	6
45 - 48		7.0	-9.2	----	5
48 - 51	23,000	11.0	-8.3	----	8
51 - 54		6.1	-8.9	----	7
54 - 57		4.9	-9.2	13.7	6
57 - 60		11.3	-3.1	9.8	4
60 - 63		7.0	-3.4	100	3
63 - 66		8.9	-8.3	----	5
66 - 69		11.3	----	14.0	2
304					

<sup>b</sup>Records not obtained for complete traverse.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 333	Time (EST) 150616 - (b)				
Traverse 3	Length of traverse 566.9 sec, 192,518 ft				
	Initial heading (deg) 360				
69 - 72	23,000	6.4	-2.8	7.2	---
72 - 75		6.4	-3.7	---	---
75 - 78		6.1	-3.4	8.3	---
78 - 81		3.4	-2.1	8.9	---
81 - 84		6.1	-3.7	---	---
84 - 87		13.8	-2.1	7.1	---
87 - 90		4.3	-2.8	---	---
90 - 93		6.4	-6.4	---	---
93 - 96		4.6	-3.4	---	---
96 - 99		4.0	-3.4	---	---
99 - 102		8.6	-7.9	---	---
102 - 105		8.9	-6.1	---	---
105 - 108		9.5	-8.3	---	---
108 - 111		8.3	-13.1	---	---
111 - 114		3.4	-5.2	4.7	---
114 - 117		4.9	-2.4	---	---
117 - 120	22,500	1.8	---	---	1
120 - 123		---	-3.7	---	2
123 - 126	22,000	---	---	---	0
126 - 129	21,500	---	---	---	0
129 - 132		4.6	---	---	2
132 - 135	21,000	---	---	---	0
135 - 138		---	---	---	0
138 - 141		1.8	-1.8	---	2
141 - 144		---	-1.8	---	1
144 - 147	20,500	1.5	---	---	1
147 - 150		---	---	---	0
150 - 153	20,000	2.8	---	3.1	1
153 - 156		---	---	---	0
156 - 159		---	---	---	0
159 - 162		---	-2.1	---	1
b162 - 165		---	---	---	0

<sup>b</sup>Records not obtained for complete traverse.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{e,max}}$ (fps)	Maximum true gust velocity $U_{t,\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 333 Traverse 4		Time (EST) 151508 - 151825 Length of traverse 173.8 sec, 50,391 ft Initial heading (deg) 250			
(c)					
Airplane 348 Traverse 1		Time (EST) - (d) Length of traverse 225.5 sec, 66,918 ft Initial heading (deg) 220			
0 - 3	15,500	8.2	-3.5	16.5	----
3 - 6		1.6	-3.5	----	----
6 - 9		----	-5.7	----	----
9 - 12		3.5	----	----	----
12 - 15		----	-4.1	----	----
15 - 18		2.8	-8.8	----	----
18 - 21		2.8	-3.5	6.4	29
21 - 24		6.3	-5.7	12.0	146
24 - 27		2.8	-5.4	4.8	174
27 - 30		4.4	-6.9	----	----
30 - 33		2.8	-8.8	----	145
33 - 36		5.0	-6.0	----	----
36 - 39		5.0	-3.5	----	----
39 - 42		6.0	-6.6	11.4	293
42 - 45		4.1	-8.8	4.9	31
45 - 48		8.5	-12.9	----	----
48 - 51		9.2	-9.2	----	----
51 - 54	16,000	6.0	-6.0	6.4	30
54 - 57		5.4	-12.6	----	----
57 - 60		11.7	-7.9	----	----
60 - 63		7.3	-17.0	----	----
63 - 66		5.4	-4.7	----	----
66 - 69		----	-3.5	-4.9	120
Airplane 348 Traverse 2		Time (EST) - (a) Length of traverse 196.6 sec, 56,526 ft Initial heading (deg) - (a)			
0 - 3	15,500	----	-2.5	----	251
3 - 6		6.9	-6.9	----	----

<sup>a</sup>No records obtained.<sup>c</sup>No records obtained due to lack of film.<sup>d</sup>Clock not installed in airplane.

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 348 Traverse 2					
6 - 9	15,500	11.3	-5.7	-----	8
9 - 12		4.4	-8.8	-----	5
12 - 15		12.9	-11.0	-----	7
15 - 18		10.4	-12.2	-----	4
18 - 21		-----	-6.3	-----	1
21 - 24		2.2	-3.5	-----	2
24 - 27		2.2	-----	-----	1
27 - 30		-----	-7.5	-----	2
30 - 33		15.1	-18.5	11.4	8
33 - 36		8.2	-11.6	-----	6
36 - 39		2.8	-3.5	-----	3
39 - 42		1.6	-3.5	-----	7
42 - 45		2.5	-6.6	-----	4
45 - 48		8.8	-5.7	-----	4
48 - 51		11.9	-10.4	14.4	8
51 - 54		3.1	-5.7	-----	4
54 - 57		-----	-3.8	-----	2
Airplane 348 Traverse 3					
0 - 3	15,500	8.8	-5.6	-----	2
3 - 6		3.1	-12.8	-----	4
6 - 9		3.1	-3.8	-----	2
9 - 12		3.1	-3.4	-----	2
12 - 15		7.5	-----	-----	1
15 - 18		5.0	-4.7	-----	3
18 - 21		5.0	-8.4	10.9	4
21 - 24		2.8	-6.3	-----	5
24 - 27		1.6	-4.1	-----	4
27 - 30		4.4	-6.9	-----	2
30 - 33		4.4	-3.4	-----	2
33 - 36		6.6	-3.8	-----	3
36 - 39		1.3	-3.8	-----	2

<sup>a</sup>No records obtained.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{t\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 348	Traverse 3	$\left\{ \begin{array}{l} \text{Time (EST) - (a)} \\ \text{Length of traverse } 200.7 \text{ sec, } 57,231 \text{ ft} \\ \text{Initial heading (deg) - (a)} \end{array} \right.$			
39 - 42		15,500	-----	-----	1
42 - 45		1.6	-3.8	-----	2
45 - 48		8.4	-3.4	6.1	3
48 - 51		5.3	-5.9	-----	7
51 - 54		4.7	-6.6	14.1	10
54 - 57		-----	-5.6	-----	3
57 - 60		-----	-----	-----	0
Airplane 348	Traverse 4	$\left\{ \begin{array}{l} \text{Time (EST) - (d)} \\ \text{Length of traverse } 276.1 \text{ sec, } 83,136 \text{ ft} \\ \text{Initial heading (deg) } 320 \end{array} \right.$			
0 - 3		15,500	-----	-----	1
3 - 6		2.8	-3.4	-----	2
6 - 9		-----	-3.4	-----	1
9 - 12		-----	-3.4	-----	1
12 - 15		3.4	-----	4.0	1
15 - 18		-----	-3.4	-----	2
18 - 21		-----	-----	-----	0
21 - 24		18.9	-14.6	-----	7
24 - 27		14.9	-7.7	15.2	7
27 - 30	16,000	5.0	-6.8	7.0	5
30 - 33		9.9	-20.4	-----	8
33 - 36		5.0	-6.5	-----	4
36 - 39		9.9	-4.3	-----	6
39 - 42		6.2	-12.4	-----	10
42 - 45		6.2	-6.5	-----	8
45 - 48		7.7	-3.4	-----	9
48 - 51		-----	-3.4	-----	1
51 - 54		2.2	-3.4	5.5	5
54 - 57		-----	-----	60	0
57 - 60		-----	-3.4	-----	2
60 - 63		3.4	-5.3	-----	2
63 - 66		2.8	-3.4	-----	4
66 - 69	15,500	5.3	-3.4	-----	4

<sup>a</sup>No records obtained.<sup>d</sup>Clock not installed in airplane.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{emax}}$ (fps)	Maximum true gust velocity $U_{\text{tmax}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 348 Traverse 4		Time (EST) - (d) Length of traverse 276.1 sec, 83,136 ft Initial heading (deg) 320			
69 - 72	15,500	----	-4.0	----	1
72 - 75		2.5	-3.1	----	2
75 - 78		2.5	----	----	1
78 - 81		----	-3.4	----	1
81 - 84		----	----	----	0
Airplane 327 Traverse 1		Time (EST) 143307 - 143507 Length of traverse 122.2 sec, 36,147 ft Initial heading (deg) 230			
0 - 3	6,000	7.6	----	----	1
3 - 6		3.8	-6.3	----	4
6 - 9		7.9	-9.2	17.7	10
9 - 12		4.1	-5.7	5.2	6
12 - 15		4.1	-4.8	----	2
15 - 18		4.4	-3.5	6.4	6
18 - 21		5.1	-7.6	----	5
21 - 24		----	-3.5	----	2
24 - 27		----	----	----	0
27 - 30		1.6	----	----	1
30 - 33		2.2	-4.1	3.7	3
33 - 36		2.5	-1.9	5.9	2
36 - 39		1.9	----	----	1
Airplane 327 Traverse 2		Time (EST) 144429 - 144820 Length of traverse 240.6 sec, 73,882 ft Initial heading (deg) 190			
0 - 3	6,000	8.5	-2.5	----	7
3 - 6		6.6	-6.9	----	9
6 - 9	6,500	2.8	-10.7	6.9	10
9 - 12		3.8	-4.7	19.8	7
12 - 15		4.1	-5.4	6.7	6
15 - 18		12.3	-8.2	----	7
18 - 21		4.4	-4.4	8.5	5
21 - 24		6.0	-6.6	-10.5	2

<sup>d</sup>Clock not installed in airplane.

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{t\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
	Airplane 327 Traverse 2	Time (EST) 144429 - 144820 Length of traverse 240.6 sec, 73,882 ft Initial heading (deg) 190			
24 - 27	6,500	6.9	-2.2	12.3	-----
27 - 30	7,000	7.6	-6.6	6.3	-3.9
30 - 33		5.7	-8.8	7.4	-----
33 - 36		-----	-2.8	-----	-----
36 - 39	6,500	10.1	-3.5	1.6	-3.5
39 - 42		6.3	-5.7	10.6	-----
42 - 45		6.0	-3.5	10.1	-6.6
45 - 48		4.7	-4.1	-----	-----
48 - 51		9.5	-7.3	-----	-----
51 - 54		6.3	-7.6	-----	-----
54 - 57	7,000	-----	-9.5	-----	-14.1
57 - 60		2.8	-4.4	8.8	-4.4
60 - 63		7.2	-4.7	-----	-----
63 - 66		5.7	-9.5	-----	-----
66 - 69		6.9	-7.2	-----	-----
69 - 72		3.8	-6.0	-----	-----
72 - 75		9.8	-5.0	-----	-3.0
Airplane 327 Traverse 3					
Time (EST) 145500 - 145728 Length of traverse 161.8 sec, 47,236 ft Initial heading (deg) 290					
0 - 3	5,500	4.7	-4.7	4.3	-8.5
3 - 6		-----	-3.8	-----	-----
6 - 9		8.1	-7.2	-----	-----
9 - 12		3.1	-3.8	-----	-----
12 - 15		3.1	-4.7	-----	-2.5
15 - 18		-----	-3.1	-----	-----
18 - 21		4.7	-----	4.9	-----
21 - 24		-----	-----	-----	203
24 - 27		-----	-----	-----	-----
27 - 30		-----	-4.4	-----	-7.8
30 - 33		4.4	-----	-----	-----
33 - 36		2.2	-----	6.1	-----
36 - 39		2.2	-----	-----	245
39 - 42	6,000	-----	-3.8	-----	-4.7
42 - 45		-----	-3.8	-----	-----
45 - 48		-----	-----	-----	293

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 103	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{t\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 327	Traverse 4	Time (EST) 150637 - 150949			
		Length of traverse 204.7 sec, 65,228 ft			
		Initial heading (deg) 230			
0 - 3	6,500	4.0	-4.0	9.7	-5.4
3 - 6		13.4	-8.4	7.3	-----
6 - 9		7.2	-7.8	-----	-----
9 - 12		17.1	-8.1	-----	-----
12 - 15		5.3	-10.3	-----	-----
15 - 18		6.2	-4.7	-----	-----
18 - 21		7.2	-11.2	16.3	-12.7
21 - 24		16.5	-10.6	-----	-----
24 - 27		3.1	-8.1	-----	-15.8
27 - 30		5.6	-2.2	7.5	-----
30 - 33		6.9	-8.1	8.8	-9.4
33 - 36		10.3	-14.9	-----	-----
36 - 39	7,000	2.8	-7.8	-----	-----
39 - 42		9.0	-5.3	-----	-----
42 - 45		3.1	-2.5	-----	-----
45 - 48		2.5	-1.9	-----	-5.1
48 - 51		-----	-3.7	-----	-----
51 - 54		6.2	-3.7	-----	-----
54 - 57		3.1	-3.7	4.9	-5.9
57 - 60		-----	-3.7	-----	137
60 - 63		2.5	-2.2	-----	252
63 - 66		-----	-----	-----	206
		-----	-----	-----	105
		-----	-----	-----	-----
Airplane 327	Traverse 5	Time (EST) 151244 - 151515			
		Length of traverse 160.7 sec, 45,306 ft			
		Initial heading (deg) 90			
0 - 3	5,500	6.5	-4.6	11.0	-4.4
3 - 6		4.0	-----	-----	-----
6 - 9		3.1	-3.7	-----	-----
9 - 12		4.6	-----	7.2	-----
12 - 15		3.1	-4.6	-----	142
15 - 18		2.5	-3.7	5.0	-----
18 - 21		-----	-----	-----	222
21 - 24		13.3	-10.5	25.2	-19.1
		-----	-----	-----	238
		-----	-----	-----	232
		-----	-----	-----	6

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 22, 1946 - Flight 14					
Airplane 327	Traverse 5	Time (EST) 151244 - 151515 Length of traverse 160.7 sec, 45,306 ft Initial heading (deg) 90			
24 - 27	6,000	5.0	-5.0	6.8	----
27 - 30		11.8	-7.4	19.8	----
30 - 33		10.2	-6.2	----	----
33 - 36		8.7	-8.7	4.0	-15.0
36 - 39	6,500	10.2	-12.7	21.4	-12.9
39 - 42		4.6	-5.3	7.1	-----
42 - 45		3.4	-6.8	-----	-10.9
45 - 48		----	----	-----	-----
July 23, 1946 - Flight 15					
Airplane 333	Traverse 1	Time (EST) 150503 - 150642 Length of traverse 53.8 sec, 20,430 ft Initial heading (deg) 350			
0 - 3	26,500	6.8	-6.2	----	----
3 - 6		----	-10.9	----	----
6 - 9	26,000	11.8	-3.1	----	----
9 - 12		8.7	-9.9	----	----
12 - 15		4.4	-3.4	----	----
15 - 18		3.4	-9.0	----	-12.2
18 - 21		11.5	-5.6	-----	-11.5
Airplane 333	Traverse 2	Time (EST) 151450 - 151642 Length of traverse 132.0 sec, 48,773 ft Initial heading (deg) 340			
0 - 3	26,500	----	-6.5	----	----
3 - 6		7.7	----	----	----
6 - 9		2.2	-6.5	----	----
9 - 12		----	-3.7	----	----
12 - 15	26,000	10.5	-3.4	22.6	419
15 - 18	26,500	4.6	-5.6	5.5	73
18 - 21		4.3	-3.7	-----	-----
21 - 24		----	----	-----	-----
24 - 27		3.4	-4.0	11.3	189

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 333	Traverse 2	Time (EST) 151450 - 151642 Length of traverse 132.0 sec, 48,773 ft Initial heading (deg) 340			
27 - 30	26,500	7.1	-3.4	---	4
30 - 33		4.6	-3.4	---	2
33 - 36		2.2	-9.0	---	4
36 - 39	26,000	7.1	-6.2	---	5
39 - 42		16.7	-7.1	---	3
42 - 45		13.9	-14.2	---	3
45 - 48		11.4	-5.3	---	4
48 - 51		4.3	-1.2	---	2
Airplane 333	Traverse 3	Time (EST) 152110 - 152224 Length of traverse 96.8 sec, 36,548 ft Initial heading (deg) 160			
0 - 3	26,000	----	----	----	0
3 - 6	26,500	10.2	-13.6	----	4
6 - 9	26,000	10.2	-5.9	----	4
9 - 12	26,500	7.1	-8.6	12.5	3
12 - 15		4.3	-1.8	----	3
15 - 18		----	-3.4	-10.6	1
18 - 21		4.6	----	----	2
21 - 24		----	-6.2	----	1
24 - 27	26,000	4.6	-6.2	9.3	2
27 - 30		10.5	-6.2	----	5
30 - 33		7.4	-2.5	----	6
33 - 36		7.1	-9.9	----	3
36 - 39		----	----	----	0
Airplane 333	Traverse 4	Time (EST) 152605 - 152917 Length of traverse 153.3 sec, 54,687 ft Initial heading (deg) 290			
0 - 3	26,000	2.8	----	----	1
3 - 6		4.9	-6.8	----	3
6 - 9		4.9	----	----	1
9 - 12		4.6	----	----	2
12 - 15		8.0	-5.8	----	3

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 333	Traverse 4	Time (EST) 152605 - 152917 Length of traverse 153.3 sec, 54,687 ft Initial heading (deg) 290			
15 - 18	26,000	1.8	-3.7	----	3
18 - 21		4.9	-2.5	----	2
21 - 24		----	-3.7	----	2
24 - 27		7.1	-3.7	----	3
27 - 30		3.7	-3.4	----	4
30 - 33		----	-2.5	----	1
33 - 36		----	-1.8	----	1
36 - 39		3.1	-3.1	----	1
39 - 42		3.7	-6.1	----	2
42 - 45		4.9	-8.6	----	2
45 - 48		3.7	-5.5	----	2
48 - 51		9.5	-4.0	----	3
51 - 54		6.8	-8.6	----	3
54 - 57		----	----	----	0
Airplane 333	Traverse 5	Time (EST) 154410 - 154528 Length of traverse 88.1 sec, 35,269 ft Initial heading (deg) - (e)			
0 - 3	26,000	3.0	-3.3	----	3
3 - 6		6.7	-6.1	7.2	4
6 - 9		9.1	----	75	1
9 - 12		4.6	-4.9	----	2
12 - 15		3.0	-7.8	----	4
15 - 18		6.7	-8.8	14.9	5
18 - 21		7.3	-5.2	275	3
21 - 24		3.9	-4.6	----	3
24 - 27		4.3	-6.7	----	5
27 - 30		7.6	-7.0	----	3
30 - 33		4.6	-3.3	----	2
33 - 36		1.8	----	----	1

<sup>a</sup>Not readable.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{e,max}}$ (fps)	Maximum true gust velocity $U_{\text{t,max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 327 Traverse 1					
0 - 3	10,500	----	----	----	----
3 - 6		----	-3.4	----	194
6 - 9		9.7	-8.1	----	115
9 - 12		6.5	-6.9	----	----
12 - 15		12.8	-4.4	----	----
15 - 18		9.7	-13.1	----	76
18 - 21		14.3	-11.5	----	----
21 - 24		8.7	-10.6	----	5
24 - 27		7.8	-3.7	----	4
27 - 30		11.2	-10.6	13.5	5
30 - 33		11.8	-8.7	----	5
33 - 36		9.3	-8.1	----	5
36 - 39		5.9	----	----	2
39 - 42		----	-2.8	----	1
42 - 45		----	-5.9	----	1
45 - 48		----	----	----	0
48 - 51		----	----	----	0
51 - 54		----	----	----	0
54 - 57		----	----	----	0
Airplane 327 Traverse 2					
0 - 3	11,000	----	----	----	0
3 - 6		----	----	----	0
6 - 9		----	----	----	0
9 - 12		----	----	----	0
12 - 15		----	----	----	0
15 - 18		----	----	----	0
18 - 21		----	----	----	0
21 - 24		----	----	----	0
24 - 27		7.7	-4.0	----	2
27 - 30		5.0	-4.0	----	4
30 - 33		----	----	----	0
33 - 36		----	----	----	0

TABLE I.-- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 327 Traverse 2					
36 - 39	10,500	-----	-----	-----	0
39 - 42	11,000	10.2	-8.4	-----	6
42 - 45		10.5	-4.3	-----	2
45 - 48		5.3	-7.4	-----	3
48 - 51		-----	-4.3	-6.0	2
51 - 54		-----	-----	-----	0
54 - 57		5.0	-7.1	-----	2
57 - 60		-----	-5.0	-----	2
60 - 63		-----	-----	-4.2	1
63 - 66		-----	-----	183	1
66 - 69		-----	-----	-----	0
69 - 72		-----	-----	-----	0
72 - 75		-----	-----	-4.2	1
75 - 78		-----	-----	-----	0
78 - 81	10,500	-----	-----	-----	0
81 - 84		-----	-----	-----	0
84 - 87		-----	-----	-----	0
Airplane 327 Traverse 3					
Time (EST) 151935 - 152314 Length of traverse 238 sec, 87,167 ft Initial heading (deg) 180					
0 - 3	11,000	4.6	-10.4	-----	2
3 - 6		8.3	-4.9	-3.1	4
6 - 9		9.8	-3.7	-----	3
9 - 12		6.4	-8.3	-----	5
12 - 15		8.0	-9.2	-15.2	3
15 - 18		3.1	-4.6	-----	5
18 - 21		-----	-----	-----	0
21 - 24		-----	-----	-----	0
24 - 27		-----	-----	-----	0
27 - 30		-----	-----	-----	0
30 - 33		-----	-----	-----	0
33 - 36		-----	-----	-----	0
36 - 39		-----	-----	-----	0

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft × 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{\text{max}}$ (fps)	Maximum true gust velocity $U_{t\text{max}}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 327 Traverse 4					
0 - 3	10,500	8.2	-7.6	---	3
3 - 6		2.7	---	---	2
6 - 9		5.8	-4.6	---	4
9 - 12		---	---	---	0
12 - 15		4.9	-3.1	---	2
15 - 18		6.1	-3.7	---	3
18 - 21		7.0	-7.9	---	3
21 - 24		---	-4.6	-7.6	1
24 - 27		---	---	---	0
27 - 30		9.2	-9.5	---	2
30 - 33		10.4	-4.9	---	4
33 - 36		3.4	-9.2	---	3
36 - 39		6.4	-5.2	---	2
39 - 42		4.0	-4.6	---	2
42 - 45		---	-2.7	---	1
45 - 48		---	-4.0	---	1
48 - 51		5.2	---	---	1
51 - 54		---	---	---	0
54 - 57		---	---	---	0
57 - 60		---	---	---	0
60 - 63		---	---	---	0
63 - 66		---	---	---	0
Airplane 327 Traverse 5					
0 - 3	10,500	---	---	---	0
3 - 6		---	---	---	0
6 - 9		3.0	4.0	147	1
9 - 12		---	7.2	195	1
Airplane 347 <sup>f</sup>					

<sup>e</sup>Not readable.<sup>f</sup>Records indicate that recording instruments were in continuous operation for 30 minutes during climb, thus exhausting film supply before traverses were made.

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 331 Traverse 1 <div style="float: right; margin-top: -20px;">             Time (EST) 151450 - 151600              Length of traverse 87.8 sec, 25,388 ft              Initial heading (deg) 350           </div>					
0 - 3	6,000	---	-2.5	---	2
3 - 6		3.1	-2.5	---	6
6 - 9		5.9	-5.6	---	7
9 - 12		5.3	-13.4	---	9
12 - 15		12.8	-6.9	---	4
15 - 18		5.6	-8.8	---	5
18 - 21	5,500	15.0	-7.2	24.1	9
21 - 24	6,000	3.1	-2.8	5.9	2
24 - 27		4.4	---	144	1
Airplane 331 Traverse 2 <div style="float: right; margin-top: -20px;">             Time (EST) 152220 - 152505              Length of traverse 124.7 sec, 33,186 ft              Initial heading (deg) 180           </div>					
0 - 3	5,500	6.2	-6.2	136	10
3 - 6		9.6	-15.6	74	11
6 - 9		14.0	-12.8	---	6
9 - 12		6.8	-3.1	279	3
12 - 15		4.4	-4.4	---	7
15 - 18		---	-3.1	---	2
18 - 21		---	---	---	0
21 - 24		---	-2.8	139	1
24 - 27		4.4	-3.4	---	6
27 - 30	6,000	3.4	-3.4	104	10
30 - 33		---	-4.4	177	3
33 - 36		---	---	---	0
Airplane 331 Traverse 3 <div style="float: right; margin-top: -20px;">             Time (EST) 153105 - (e)              Length of traverse 96.8 sec, 28,497 ft              Initial heading (deg) - (e)           </div>					
0 - 3	6,000	6.2	-9.9	---	10
3 - 6		3.1	-8.4	4.9	5
6 - 9		2.8	-5.3	115	6
9 - 12		3.1	-3.7	247	6
12 - 15	5,500	5.6	-4.0	152	6

<sup>e</sup>Not readable.

TABLE I.- SUMMARY OF GUST MEASUREMENTS - Continued

Space interval ft $\times 10^3$	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 331 Traverse 3					
15 - 18	5,500	2.8	-3.7	8.4	---
18 - 21		---	-2.8	---	-4.7
21 - 24		---	-2.8	---	---
24 - 27		---	-2.8	---	---
27 - 30		---	---	---	1
0 - 3	5,500	7.4	-7.7	8.3	12
3 - 6		5.3	-4.0	4.5	9
6 - 9		6.5	-9.6	4.6	7
9 - 12	6,000	3.7	-3.1	7.0	8
12 - 15		3.4	-3.4	---	3
15 - 18		5.9	-5.6	5.4	7
18 - 21		3.1	---	3.9	2
21 - 24		2.5	-2.8	---	3
24 - 27		3.1	-5.3	---	5
27 - 30		2.5	---	4.8	1
30 - 33		2.5	-2.8	6.7	4
33 - 36		4.0	-4.9	---	6
36 - 39		3.4	-5.3	7.8	11
39 - 42		13.9	-2.5	4.7	6
42 - 45		11.1	-10.5	9.0	8
45 - 48		4.6	-8.0	---	9
48 - 51		2.8	-7.1	---	8
51 - 54		2.8	-3.1	---	5
54 - 57		2.8	---	4.7	4
57 - 60		2.8	-5.3	---	3
60 - 63		4.9	-4.9	---	12
63 - 66		3.4	-5.3	---	7
66 - 69		7.7	-11.4	---	10
69 - 72		4.9	-7.1	---	7
72 - 75		3.7	-3.1	---	6
75 - 78		---	-2.8	---	2
78 - 81		---	-2.8	---	2

<sup>e</sup>Not readable.

TABLE I. - SUMMARY OF GUST MEASUREMENTS - Concluded

Space interval ft x 10 <sup>3</sup>	Pressure altitude (ft)	Maximum effective gust velocity $U_{e\max}$ (fps)	Maximum true gust velocity $U_{t\max}$ (fps)	Gust gradient distance (ft)	No. of gusts
July 23, 1946 - Flight 15					
Airplane 331 Traverse 5					
0 - 3	5,500	8.6	-11.1	-----	8
3 - 6		8.0	-2.5	3.9	10
6 - 9		7.1	-6.8	-----	9
9 - 12	6,000	4.9	-9.5	-----	10
12 - 15	5,500	3.4	-5.8	5.4	6
15 - 18		16.9	-7.1	-----	6
18 - 21	6,000	9.5	-6.8	-----	8
21 - 24		9.2	-2.8	-----	9
24 - 27		-----	-----	-----	0
27 - 30		3.4	-3.1	3.9	4
30 - 33		-----	-3.1	-----	1
33 - 36		3.4	-6.2	-----	5
36 - 39		3.4	-3.1	-----	4
39 - 42		5.8	-3.1	-4.8	5
42 - 45		3.1	-4.6	-5.0	6
45 - 48		2.8	-4.3	-----	7
48 - 51		2.2	-----	-----	1

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TABLE II.-- SUMMARY OF DRAFT VELOCITY MEASUREMENTS FROM FLIGHTS  
OF P-61C AIRPLANES WITHIN THUNDERSTORMS

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Traverse no.	Draft location from cloud entry (ft)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
7-22-46	14	347	26,000	1	23,053	25,886	2,833	26.8
					31,813	48,280	16,467	-12.3
				a <sub>2</sub>				
				3	45,722	67,072	21,350	32.6
				4	16,173	32,096	15,923	54.8
	333	21,000		5	4,671	14,576	9,905	-7.8
					15,132	17,420	2,288	34.3
					33,163	70,879	37,716	20.3
					7,499	15,566	8,067	-9.5
					21,173	33,646	12,473	33.0
	348	16,000		1	19,402	23,166	3,764	19.1
					3	26,104	52,104	25.6
					86,445	96,271	9,826	24.8
					4	20,473	29,712	9,239
					11,229	16,104	4,875	13.9
	327	6,000		2	36,627	56,634	20,007	7.0
					13,456	20,850	7,394	10.5
				a <sub>3</sub>				
				4	22,901	31,595	8,694	34.1
				a <sub>1</sub>				
				a <sub>2</sub>				
				a <sub>3</sub>				
				4	9,998	20,778	10,780	12.0
				5	28,672	42,344	13,672	20.9

<sup>a</sup>No draft velocities indicated by records.

TABLE II. - SUMMARY OF DRAFT VELOCITY MEASUREMENTS - Concluded

Date	Flight no.	Air-plane no.	Assigned altitude (ft)	Traverse no.	Draft location from cloud entry (ft)		Draft extent (ft)	Average draft velocity (fps)
					Start	End		
7-23-46	15	333	26,000	1	8,612	11,291	2,679	43.5
				2	14,498	22,395	7,897	14.9
					28,926	33,566	4,640	22.6
					35,533	42,100	6,567	-43.5
				3	10,685	22,441	11,756	-13.1
	327	11,000		4	29,621	44,577	14,956	10.8
				5	8,755	13,271	4,516	32.4
					13,271	19,075	5,804	-22.1
				1	14,531	26,827	12,296	16.8
				a <sub>2</sub>				
	347 <sup>b</sup>	21,000		a <sub>3</sub>				
				4	28,708	43,828	15,120	15.9
				a <sub>5</sub>				
				331	6,000	1	6,603	18,557
				a <sub>2</sub>			11,954	-18.8
				a <sub>3</sub>				
				a <sub>4</sub>				
				5	6,563	10,719	4,156	23.8

<sup>a</sup>No draft velocities indicated by records.

<sup>b</sup>No records obtained during traverses.

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